

Name

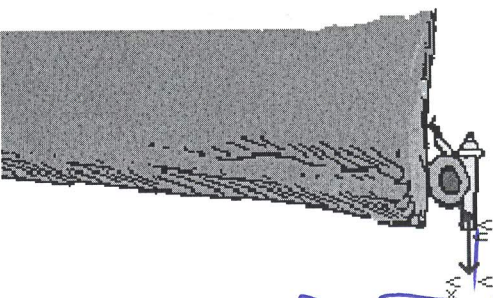
Keg* Me

Regents Test 2-D

Kinematics

Show all formulas and work

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$$v_{x1} = 60 \text{ m/s}$$

$$v_{y1} = 0$$

$$a_y = 9.8 \text{ m/s}^2$$

#1. A projectile is fired straight off of a 50 m high cliff at 60 m/s as shown in the diagram

Find

a) the time it takes to hit the ground

$$t = \sqrt{\frac{50 \text{ m}}{4.9}} = 3.2 \text{ sec}$$

$$dy = v_{iy}t + \frac{1}{2}a_yt^2$$

$$50 \text{ m} = 0 + \frac{1}{2}(9.8 \text{ m/s}^2)t^2$$

b) the horizontal distance it will travel

$$v_x = \frac{dx}{dt} \therefore dx = v_x t = (60 \text{ m/s})(3.2 \text{ s}) = 192 \text{ m}$$

c) The velocity when it hits the ground

$$v_x = 60 \text{ m/s}$$

$$v_y = v_{y1} + a_y t$$

$$v_y = 0 + (9.8)(3.2) = 31.4 \text{ m/s}$$

$$v = \sqrt{60^2 + 31.4^2} = 67.7 \text{ m/s}$$